ESTUARINE COASTAL AND SHELF SCIENCE

Volume 12
1981

ACADEMIC PRESS
London New York
Toronto Sydney
San Francisco

Published by Academic Press Inc. (London) Ltd in association with the Estuarine and Brackish-water Sciences Association

ISSN 0272–7714

Copyright © 1981, by Academic Press Inc. (London) Ltd.

ALL RIGHTS RESERVED

No part of this volume may be reproduced in any form, by photostat, microfilm, or any other means, without written permission from the publishers.

Printed in Great Britain

Contents of Volume 12

Number 1, January 1981

Editorial 1

Hardy, J. T. and Valett, M., Natural and microcosm phytoneuston communities of Sequim Bay, Washington 3

Pickaver, A. H. and Lyes, M. C., Aerobic microbial activity in surface sediments containing high or low concentrations of zinc taken from Dublin Bay, Ireland . 13

Pickrill, R. A., Irwin, J. and Shakespeare, B. S., Circulation and sedimentation in a tidal-influenced fjord lake: Lake McKerrow, New Zealand . . . 23

Tenore, K. R., Organic nitrogen and caloric content of detritus. I. Utilization by the deposit-feeding polychaete, *Capitella capitata* 39

Chapman, P. M. and Brinkhurst, R. O., Seasonal changes in interstitial salinities and seasonal movements of subtidal benthic invertebrates in the Fraser River estuary, B.C. 49

Chapman, P. M., Measurements of the short-term stability of interstitial salinities in subtidal estuarine sediments 67

Cloern, J. E. and Cheng, R. T., Simulation model of *Skeletonema costatum* population dynamics in northern San Francisco Bay, California 83

Griffiths, R. J., Population dynamics and growth of the bivalve *Choromytilus meridionalis* (Kr.) at different tidal levels 101

Notes and Discussions

Hockin, D. C., An apparatus to study the colonization of sediments by the meiofauna 119

Number 2, February 1981

Fouda, M. M. and Miller, P. J., Age and growth of the common goby, *Pomatoschistus microps*, on the south coast of England 121

Smethie, W. M. Jr., Vertical mixing rates in fjords determined using radon and salinity as tracers 131

Breteler, R. J., Valiela, I. and Teal, J. M., Bioavailability of mercury in several north-eastern U.S. *Spartina* ecosystems 155

Grant, C. J., Gill net selectivity and catch rates of coastal pelagic fish in Jamaica . 167

Ianniello, J. P., Tidally-induced residual currents in Long Island and Block Island Sounds 177

Guary, J. C. and Fowler, S. W., Americium-241 and plutonium-237 turnover in mussels (*Mytilus galloprovincialis*) living in field enclosures . . . 193

Morris, A. W., Bale, A. J. and Howland, R. J. M., Nutrient distributions in an estuary: evidence of chemical precipitation of dissolved silicate and phosphate . 205

Garver, J. L. and Lewin, J., Persistent blooms of surf diatoms along the Pacific coast, U.S.A. 1. Physical characteristics of the coastal region in relation to the distribution and abundance of the species 217

Notes and Discussions

Gotto, J. W., Tabita, F. R. and Van Baalen, C., Nitrogen fixation in intertidal environments of the Texas Gulf coast 231

Number 3, March 1981

Penrose, J. D. and Beer, T., Acoustic reflection from estuarine pycnoclines . 237

Rattray, M., Jr. and Officer, C. B., Discussion of trace metals in the waters of a partially-mixed estuary 251

McLachlan, A., Dye, A. and Harty, B., Simulation of the interstitial system of exposed sandy beaches 267

Heath, R. A., Tidal energy loss in coastal embayments 279

Heath, R. A., Resonant period and Q of the Celtic Sea and Bristol Channel . 291

Knight, D. W., Some field measurements concerned with the behaviour of resistance coefficients in a tidal channel 303

West, J. R. and Cotton, A. P., The measurement of diffusion coefficients in the Conwy estuary 323

Notes and Discussions

Parker, J. G., Ciliated Protozoa of the polluted Tees estuary . . . 337

KULCZYCKI, G. R., VIRNSTEIN, R. W. and NELSON, W. G., The relationship between fish abundance and algal biomass in a seagrass–drift algae community. . 341

BOOK REVIEWS 349

NUMBER 4, APRIL 1981

HART, B. T. and DAVIES, S. R. H., Trace metal speciation in the freshwater and estuarine regions of the Yarra River, Victoria 353

DE BORNE DE GRANDPRÉ, C., EL-SABH, M. I. and SALOMON, J. C., A two-dimensional numerical model of the vertical circulation of tides in the St. Lawrence estuary . 375

GRAFF, J., An investigation of the frequency distributions of annual sea level maxima at ports around Great Britain 389

GALLAGHER, J. L. and KIBBY, H. V., The streamside effect of a *Carex lyngbyei* estuarine marsh: the possible role of recoverable underground reserves . . . 451

BUCH, E., On entrainment and vertical mixing in stably stratified fjords . . 461

FINDLAY, S. E. G., Small-scale spatial distribution of meiofauna on a mud- and sandflat 471

GORE, R. H., GALLAHER, E. E., SCOTTO, L. E. and WILSON, K. A., Studies on decapod Crustacea from the Indian River region of Florida. XI. Community composition, structure, biomass and species–areal relationships of seagrass and drift algae-associated macrocrustaceans 485

ANNOUNCEMENTS 509

NUMBER 5, MAY 1981

LEMASSON, L. and PAGÈS, J., Excretion of dissolved organic phosphorus in tropical brackish waters 511

OFFICER, C. B. and LYNCH, D. R., Dynamics of mixing in estuaries . . 525

SHACKLEY, S. E., The intertidal soft sediments and their macrofauna in the Greater Swansea Bay area (Worm's Head to Nash Point), South Wales . . . 535

SHEPPARD, C. R. C., The groove and spur structures of Chagos atolls and their coral zonation 549

GIURGEVICH, J. R. and DUNN, E. L., A comparative analysis of the CO_2 and water vapor responses of two *Spartina* species from Georgia coastal marshes . . 561

EMERY, K. O., Low marine terraces of Grand Cayman Island . . . 569

LIVINGSTONE, D. C. and PATRIQUIN, D. G., Belowground growth of *Spartina alterniflora* Loisel.: habit, functional biomass and non-structural carbohydrates . 579

ATLAS, R. M., BOEHM, P. D. and CALDER, J. A., Chemical and biological weathering of oil, from the Amoco Cadiz spillage, within the littoral zone . . . 589

BARRIE, J. V., Hydrodynamic factors controlling the distribution of heavy minerals (Bristol Channel) 609

NOTES AND DISCUSSIONS

HACKNEY, C. T. and BISHOP, T. D., A note on the relocation of marsh debris during a storm surge 621

BOOK REVIEWS 625

NUMBER 6, JUNE 1981

KLINKHAMMER, G. P. and BENDER, M. L., Trace metal distributions in the Hudson River estuary 629

GRIFFITHS, C. L. and STENTON-DOZEY, J., The fauna and rate of degradation of stranded kelp 645

HOWARTH, M. J. and JONES, J. E., A comparison of numerical model and observed currents during a storm surge period 655

HASTINGS, M. H., The life cycle and productivity of an intertidal population of the amphipod *Ampelisca brevicornis* 665

MATTHEWS, J. B., The seasonal circulation of the Glacier Bay, Alaska fjord system . 679

TONER, R. C., Interrelationships between biological, chemical and physical variables in Mount Hope Bay, Massachusetts 701

MOORE, W. S., Radium isotopes in the Chesapeake Bay 713

HARGRAVE, B. T. and PHILLIPS, G. A., Annual *in situ* carbon dioxide and oxygen flux across a subtidal marine sediment 725

WILLIAMS, P., Detritus utilization by *Mytilus edulis* 739

Index to Volume 12

Note: The subject index is based upon the keywords allocated to each paper. The keywords are rotated in order so that each one appears once as the first index term. The complete list of permitted keywords is published in *Estuarine and Coastal Marine Science* **5** (2), i–xl.

Acoustic scattering; reflection; pycnocline; zooplankton; salt wedge, 237
Age determination; annual cycles; seasonal variations; carbohydrates; Nova Scotia coast; salt marshes; vegetation; growth rates, 579
— —; growth; reproduction; English Channel; fish; gobies; estuaries; scales, 121
Algae; coastal lagoons; Florida coast; community composition; decapod crustaceans; population dynamics; biomass; sea grasses, 485
—; coral atolls; zonation; spurs; calcareous sediments, 549
—; fish; ecology; predator control; gobies; population dynamics; sea grasses; Florida, 341
—; mats; Gulf of Mexico; Texas coast; nitrogen fixation; estuaries, 231
Americium; plutonium; radionuclides; contaminant removal; Mytilus; Mediterranean Sea, 193
Ammonia; nitrates; silicates; zooplankton; Gastropoda; wind; phytoplankton; nutrients, 701
Amphipoda; Isle of Man; productivity; life cycles, 665
—; kelp; strand and strandline; faunal association; dehydration; degradation; Insecta, 645
ANNOUNCEMENTS, 509
Annual cycles; seasonal variations; carbohydrates; Nova Scotia coast; salt marshes; vegetation; growth rates; age determination, 579
— variations; ports; Great Britain; tides; sea levels; flood; frequencies; distribution, 389
Assimilation; diffusion–advection models; dispersion; heavy metals; mass transport, 251
ATLAS, R. M., BOEHM, P. D. and CALDER, J. A., Chemical and biological weathering of oil, from the Amoco Cadiz spillage, within the littoral zone, 589
Australia coast; speciation; heavy metals; estuaries; rivers; chelates; dialysis; coagulation, 353
Bacteria; sand; interstitial; nutrients; meiofauna, 267
—; zinc; heavy metals; intertidal environment; Ireland coast; sediments; metabolism, 13
BALE, A. J., *see* MORRIS, A. W., 205
BARRIE, J. V., Hydrodynamic factors controlling the distribution of heavy minerals (Bristol Channel), 609
Bays; tidal friction; energy balance; friction coefficients; phase; amplitude; Bristol Channel, 279
Beach width; slopes; clay mineralogy; grain size; Oregon coast; Washington coast; Columbia River; diatoms, 217
BEER, T., *see* PENROSE, J. D., 237
BENDER, M. L., *see* KLINKHAMMER, G. P., 629
Benthic organisms; seasonal cycles; estuaries; Oligochaeta; British Columbia coast; salinity variations; interstitial water, 49
Biomass; sea grasses; algae; coastal lagoons; Florida coast; community composition; decapod crustaceans; population dynamics, 485
BISHOP, T. D., *see* HACKNEY, C. T., 621
Bivalves; population dynamics; growth rates; reproduction; littoral; South Africa coast, 101
BOEHM, P. D., *see* ATLAS, R. M., 589
BOOK REVIEWS, 349, 625
Bottom waters; internal waves; tides; mixing; seasonal cycles; estuaries; fjords; glaciers, 679
Brackish waters; Ivory Coast; organic compounds; phosphorus; excretion; tropical regions, 511
BRETELER, R. J., VALIELA, I. and TEAL, J. M., Bioavailability of mercury in several north-eastern U.S. *Spartina* ecosystems, 155
BRINKHURST, R. O., *see* CHAPMAN, P. M., 49
Bristol Channel; bays; tidal friction; energy balance; friction coefficients; phase; amplitude, 279
— — ; heavy minerals; entrainment; sediment–water interface; Reynold's Number; mineral deposits, 609
— —; semidiurnal tide; resonance; Celtic Sea, 291
British Columbia coast; mixing processes; vertical; fjords; radon; salinity variations; tidal power, 131

— — —; salinity variations; interstitial water; benthic organisms; seasonal cycles; estuaries; Oligochaeta, 49
— — —; sediment cores; salinity variations; interstitial water, 67
Buch, E., On entrainment and vertical mixing in stably stratified fjords, 461
Calcareous sediments; algae; coral atolls; zonation; spurs, 549
Calder, J. A., *see* Atlas, R. M., 589
Caloric content; Polychaeta; nutrition; detritus; nitrogen, 39
Carbohydrates; Nova Scotia coast; salt marshes; vegetation; growth rates; age determination; annual cycles; seasonal variations, 579
Carbon; transport; hurricanes; Mississippi; debris line: storm surge, 621
— dioxide; oxygen; organic matter; Nova Scotia coast; sediments, 725
Caribbean Sea; terraces; erosion; coastal erosion forms; limestone; radioactive dating; sea levels, 569
Catch; gill nets; Jamaica; fish; coasts; pelagic, 167
Celtic Sea; Bristol Channel; semidiurnal tide; resonance, 291
Chapman, P. M., Measurements of the short-term stability of interstitial salinities in subtidal estuarine sediments, 67
— and Brinkhurst, R. O., Seasonal changes in interstitial salinities and seasonal movements of subtidal benthic invertebrates in the Fraser River estuary, B.C., 49
Chelates; dialysis; coagulation; Australian coast; speciation; heavy metals; estuaries; rivers, 353
Chemical interactions; England coast; nutrients; nitrates; phosphates; silicates; estuaries, 205
Cheng, R. T., *see* Cloern, J. E., 83
Chesapeake Bay; radioactive isotopes; radium, 713
Ciliata; England coast; heavy metals; tolerance, 337
Circulation; suspended sediments; salt wedge; salinity data; temperature profiles; New Zealand coast; limnology (physical); estuarine sedimentation, 23
Clay mineralogy; grain size; Oregon coast; Washington coast; Columbia River; diatoms; beach width; slopes, 217
Cloern, J. E. and Cheng, R. T., Simulation model of *Skeletonema costatum* population dynamics in northern San Francisco Bay, California, 83
Coagulation; Australia coast; speciation; heavy metals; estuaries; rivers; chelates; dialysis, 353
Coastal erosion forms; limestone; radioactive dating; sea levels; Caribbean Sea; terraces; erosion, 569
— lagoons; Florida coast; community composition; decapod crustaceans; population dynamics; biomass; sea grasses; algae, 485
Coasts; pelagic; catch; gill nets; Jamaica; fish, 167
Colonization; Copepoda; meiofauna; sediments, 119
Columbia River; diatoms; beach width; slopes; clay mineralogy; grain size; Oregon coast; Washington coast, 217
Community composition; decapod crustaceans; population dynamics; biomass; sea grasses; algae; coastal lagoons; Florida coast, 485
Contaminant removal; Mytilus; Mediterranean Sea; americium; plutonium; radionuclides, 193
Continuity of salt; convective mixing; diffusion–advection models; dispersion; mixing; mixing processes, 525
Convective mixing; diffusion–advection models; dispersion; mixing; mixing processes; continuity of salt, 525
Copepoda; meiofauna; sediments; colonization, 119
—; South Carolina; meiobenthos; spatial distribution; heterogeneity; sampling systems; Nematoda, 471
Coral atolls; zonation; spurs; calcareous sediments; algae, 549
Cotton, A. P., *see* West, J. R., 323
Crabs; mussels; sewage disposal; Massachusetts coast; mercury; metal uptake; salt marshes; marsh plants, 155
Cultures; Washington coast; neuston; plankton; micro-algae; species composition; spatial distribution, 3
Current measurements; Irish Sea; surges; numerical model, 655
Davies, S. H. R., *see* Hart, B. T., 353
De Borne de Grandpré, C., El-Sabh, M. I. and Salomon, J. C., A two-dimensional numerical model of the vertical circulation of tides in the St. Lawrence estuary, 375

Debris line; storm surge; carbon; transport; hurricanes; Mississippi, 621
Decapod crustaceans; population dynamics; biomass; sea grasses; algae; coastal lagoons; Florida coast; community composition, 485
Degradation; Insecta; Amphipoda; kelp; strand and strandline; faunal association; dehydration, 645
Dehydration; degradation; Insecta: Amphipoda; kelp; strand and strandline; faunal association, 645
Detritus; nitrogen; caloric content; Polychaeta; nutrition, 39
—; salt marshes; Tijuana Estuary, California; mussels, 739
Dialysis; coagulation; Australia coast; speciation; heavy metals; estuaries; rivers; chelates, 353
Diatoms; beach width; slopes; clay mineralogy; grain size; Oregon coast; Washington coast; Columbia River, 217
Diffusion–advection models; dispersion; heavy metals; mass transport; assimilation, 251
— —; —; mixing; mixing processes; continuity of salt; convective mixing, 525
Diffusion; tracers; dyes; vertical; horizontal; Wales coast; estuarine circulation, 323
Dispersion; heavy metals; mass transport; assimilation; diffusion–advection models, 251
—; mixing; mixing processes; continuity of salt; convective mixing; diffusion–advection models, 525
Distribution; annual variations; ports; Great Britain; tides; sea levels; flood; frequencies, 389
Drag coefficients; Froude number; fjords; mixing; entrainment; shear stress, 461
DUNN, E. L., *see* GIURGEVICH, J. R., 561
DYE, A., *see* MCLACHLAN, A., 267
Dyes; vertical; horizontal; Wales coast; estuarine circulation; diffusion; tracers, 423
Ecology; population dynamics; primary production; estuarine circulation; San Francisco Bay; phytoplankton, 83
—; predator control; gobies; population dynamics; sea grasses; Florida; algae; fish, 341
EDITORIAL, 1
EL-SABH, M. I., *see* DE BORNE DE GRANDPRÉ, C., 375
EMERY, K. O., Low marine terraces of Grand Cayman Island, 569
Energy balance; friction coefficients; phase; amplitude; Bristol Channel; bays, tidal friction, 279
England coast; heavy metals; tolerance; Ciliata, 337
— —; nutrients; nitrates; phosphates; silicates; estuaries; chemical interactions, 205
English Channel; fish; gobies; estuaries; scales; age determination; growth; reproduction, 121
— —; oil spills; microbial degradation; littoral zones; oil pollution; sediments; hydrocarbons; intertidal environment, 589
Entrainment; sediment–water interface; Reynold's Number; mineral deposits; Bristol Channel; heavy minerals, 609
—; shear stress; drag coefficients; Froude number; fjords; mixing, 461
Erosion; coastal erosion forms; limestone; radioactive dating; sea levels; Caribbean Sea; terraces, 569
Estuaries; algae; mats; Gulf of Mexico; Texas coast; nitrogen fixation, 231
—; chemical interactions; England coast; nutrients; nitrate; phosphate; silicate, 205
—; fjords; glaciers; bottom waters; internal waves; tides; mixing; seasonal cycles, 679
—; Oligochaeta; British Columbia coast; salinity variations; interstitial water; benthic organisms; seasonal variations, 49
—; rivers; chelates; dialysis; coagulation; Australia coast; speciation; heavy metals, 353
—; scales; age determination; growth; reproduction; English Channel; fish; gobies, 121
—; tides; vertical circulation; mixing; Saint Lawrence estuary; numerical model, 375
Estuarine circulation; diffusion; tracers; dyes; vertical; horizontal; Wales coast, 323
— —; salinity; Hudson River; metals; pollution/chemical, 629
— —; San Francisco Bay; phytoplankton; ecology; population dynamics; primary production, 83
— —; tidal currents; tide models; Long Island, 177
— sedimentation; circulation; suspended sediments; salt wedge; salinity data; temperature profiles; New Zealand coast; limnology (physical), 23
Excretion; tropical regions; brackish waters; Ivory Coast; organic compounds; phosphorus, 511
Faunal association; dehydration; degradation; Insecta; Amphipoda; kelp; strand and strandline, 645

FINDLAY, S. E. G., Small-scale spatial distribution of meiofauna on a mud- and sandflat, 471
Fish; coasts; pelagic; catch; gill nets; Jamaica, 167
—; ecology; predator control; gobies; population dynamics; sea grasses; Florida, algae, 341
—; gobies; estuaries; scales; age determination; growth; reproduction; English Channel, 121
Fjords; glaciers; bottom waters; internal waves; tides; mixing; seasonal cycles; estuaries, 679
—; mixing; entrainment; shear stress; drag coefficients; Froude number, 461
—; radon; salinity variations; tidal power; British Columbia coast; mixing processes; vertical, 131
Flood; frequencies; distribution; annual variations; ports; Great Britain; tides; sea levels, 389
Florida; algae; fish; ecology; predator control; gobies; population dynamics; sea grasses, 341
— coast; community composition; decapod crustaceans; population dynamics; biomass; sea grasses; algae; coastal lagoons, 485
FOUDA, M. M. and MILLER, P. J., Age and growth of the common goby, *Pomatoschistus microps*, on the south coast of England, 121
FOWLER, S. W., *see* GUARY, J. C., 193
Frequencies; distribution; annual variations; ports; Great Britain; tides; sea levels; flood, 389
Friction coefficients; phase; amplitude; Bristol Channel; bays; tidal friction; energy balance, 279
Froude number; fjords; mixing; entrainment; shear stress; drag coefficients, 461
GALLAGHER, J. L. and KIBBY, H. V., The streamside effect in a *Carex lyngbyei* estuarine marsh: the possible role of recoverable underground reserves, 451
GALLAHER, E. E., *see* GORE, R. H., 485
GARVER, J. L. and LEWIN, J., Persistent blooms of surf diatoms along the Pacific Coast, U.S.A. I. Physical characteristics of the coastal region in relation to the distribution and abundance of the species, 217
Gas exchange; photosynthesis; marsh plants; Georgia coast, 561
Gastropoda; wind; phytoplankton; nutrients; ammonia; nitrates; silicates; zooplankton, 701
Georgia coast; gas exchange; photosynthesis; marsh plants, 561
Gill nets; Jamaica; fish; coasts; pelagic; catch, 167
GIURGEVICH, J. R. and DUNN, E. L., A comparative analysis of the CO_2 and water vapor responses of two *Spartina* species from Georgia coastal marshes, 561
Glaciers; bottom waters; intertidal waves; tides; mixing; seasonal cycles; estuaries, fjords, 679
Gobies; estuaries; scales; age determination; growth; reproduction; English Channel; fish, 121
—; population dynamics; sea grasses; Florida; algae; fish; ecology; predator control, 341
GORE, R. H., GALLAHER, E. E., SCOTTO, L. E. and WILSON, K. A., Studies on decapod crustacea from the Indian River region of Florida. XI. Community composition, structure, biomass and species–areal relationships of seagrass and drift algae-associated macrocrustaceans, 485
GOTTO, J. W., TABITA, F. R. and VAN BAALEN, C., Nitrogen fixation in intertidal environments of the Texas Gulf coast, 231
GRAFF, J., An investigation of the frequency distributions of annual sea level maxima at ports around Great Britain, 389
Grain size; Oregon coast; Washington coast; Columbia River; diatoms; beach width; slopes; clay mineralogy, 217
— — composition; wave energy; wave environment; Wales coast; macrobenthos; zonation; intertidal sand habitat, 535
GRANT, C. J., Gill net selectivity and catch rates of coastal pelagic fish in Jamaica, 167
Great Britain; tides; sea levels; flood; frequencies; distribution; annual variations; ports, 389
GRIFFITHS, C. L. and STENTON-DOZEY, J., The fauna and rate of degradation of stranded kelp, 645
GRIFFITHS, R. J., Population dynamics and growth of the bivalve *Choromytilus meriodionalis* (Kr.) at different tidal levels, 101
Growth; reproduction; English Channel; fish; gobies; estuaries; scales; age determination, 121
— rates; age determination; annual cycles; seasonal variations; carbohydrates; Nova Scotia coast; salt marshes; vegetation, 579
— —; reproduction; littoral; South Africa coast; bivalves; population dynamics, 101
GUARY, J. C. and FOWLER, S. W., Americium-241 and plutonium-237 turnover in mussels (*Mytilus galloprovincialis*) living in field enclosures, 193
Gulf of Mexico; Texas coast; nitrogen fixation; estuaries; algae; mats, 231
HACKNEY, C. T. and BISHOP, T. D., A note on the relocation of marsh debris during a storm surge, 621

HARDY, J. T. and VALETT, M., Natural and microcosm phytoneuston communities of Sequim Bay, Washington, 3
HARGRAVE, B. T. and PHILLIPS, G. A., Annual *in situ* carbon dioxide and oxygen flux across a subtidal marine sediment, 725
HART, B. T. and DAVIES, S. H. R., Trace metal speciation in the freshwater and estuarine regions of the Yarra River, Victoria, 353
HARTY, B., *see* MCLACHLAN, A., 267
HASTINGS, M. H., The life cycle and productivity of an intertidal population of the amphipod *Ampelisca brevicornis*, 665
HEATH, R. A., Resonant period and Q of the Celtic Sea and Bristol Channel, 291
—, Tidal energy loss in coastal embayments, 279
Heavy metals; estuaries; rivers; chelates; dialysis; coagulation; Australia coast; speciation, 353
— —; intertidal environment; Ireland coast; sediments; metabolism; bacteria, zinc, 13
— —; mass transport; assimilation; diffusion–advection models; dispersion, 251
— —; tolerance; Ciliata; England coast, 337
— minerals; entrainment; sediment–water interface; Reynold's Number; mineral deposits; Bristol Channel, 609
Heterogeneity; sampling systems; Nematoda; Copepoda; South Carolina; meiobenthos; spatial distribution, 471
HOCKIN, D. C., An apparatus to study the colonization of sediments by the meiofauna, 119
Horizontal; Wales coast; estuarine circulation; diffusion; tracers; dyes; vertical, 323
HOWARTH, M. J. and JONES, J. E., A comparison of numerical model and observed currents during a storm surge period, 655
HOWLAND, R. J. M., *see* MORRIS, A. W., 205
Hudson River; metals; pollution/chemical; estuarine circulation; salinity, 629
Hurricanes; Mississippi; debris line; storm surge; carbon; transport, 621
Hydrocarbons; intertidal environment; English Channel; oil spills; microbial degradation; littoral zones; oil pollution; sediments, 589
IANNIELLO, J. P., Tidally-induced residual currents in Long Island and Block Island Sounds, 177
Insecta; Amphipoda; kelp; strand and strandline; faunal association; dehydration; degradation, 645
Internal waves; tides; mixing; seasonal cycles; estuaries; fjords; glaciers; bottom waters, 679
Interstitial; nutrients; meiofauna; bacteria; sand, 267
— water; benthic organisms; seasonal cycles; estuaries; Oligochaeta; British Columbia coast; salinity variations, 49
— —; British Columbia coast; sediment cores; salinity variations, 67
Intertidal environment; English Channel; oil spills; microbial degradation; littoral zones, oil pollution; sediments; hydrocarbons, 589
— —; Ireland coast; sediments; metabolism; bacteria; zinc; heavy metals, 13
— sand habitat; grain size composition; wave energy; wave environment; Wales coast; macrobenthos; zonation, 535
Ireland coast; sediments; metabolism; bacteria; zinc; heavy metals; intertidal environment, 13
Irish Sea; surges; numerical model; current measurements, 655
IRWIN, J., *see* PICKRILL, R. A., 23
Isle of Man; productivity; life cycles; Amphipoda, 665
Ivory Coast; organic compounds; phosphorus; excretion; tropical regions; brackish waters, 511
Jamaica; fish; coasts; pelagic; catch; gill nets, 167
JONES, J. E., *see* HOWARTH, M. J., 655
Kelp; strand and strandline; faunal association; dehydration; degradation; Insecta; Amphipoda, 645
KIBBY, H. V., *see* GALLAGHER, J. L., 451
KLINKHAMMER, G. P. and BENDER, M. L., Trace metal distributions in the Hudson River estuary, 629
KNIGHT, D. W., Some field measurements concerned with the behaviour of resistance coefficients in a tidal channel, 303
KULCZYCKI, G. R., VIRNSTEIN, R. W. and NELSON, W. G., The relationship between fish abundance and algal biomass in a seagrass–drift algae community, 341

LEMASSON, L. and PAGÈS, J., Excretion of dissolved organic phosphorus in tropical brackish waters, 511
LEWIN, J., *see* GARVER, J. L., 217
Life cycles; Amphipoda; Isle of Man; productivity, 665
Limestone; radioactive dating; sea levels; Caribbean Sea; terraces; erosion; coastal erosion forms, 569
Limnology (physical); estuarine sedimentation; circulation; suspended sediments; salt wedge; salinity data; temperature profiles; New Zealand coast, 23
Littoral; South Africa coast; bivalves; population dynamics; growth rates; reproduction, 101
— zones; oil pollution; sediments; hydrocarbons; intertidal environment; English Channel; oil spills; microbial degradation, 589
LIVINGSTONE, D. C. and PATRIQUIN, D. G., Belowground growth of *Spartina alterniflora* Loisel.: habit, functional biomass and non-structural carbohydrates, 579
Long Island; estuarine circulation; tidal currents; tide models, 177
LYES, M. C., *see* PICKAVER, A. M., 13
LYNCH, D. R., *see* OFFICER, C. B., 525
Macrobenthos; zonation; intertidal sand habitat; grain size composition; wave energy; wave environment; Wales coast, 535
Marsh plants; crabs; mussels; sewage disposal; Massachusetts coast; mercury; metal uptake; salt marshes, 155
— —; Georgia coast; gas exchange; photosynthesis, 561
Massachusetts coast; mercury; metal uptake; salt marshes; marsh plants; crabs; mussels; sewage disposal, 155
Mass transport; assimilation; diffusion–advection models; dispersion; heavy metals, 251
Mats; Gulf of Mexico; Texas coast; nitrogen fixation; estuaries; algae, 231
MATTHEWS, J. B., The seasonal circulation of the Glacier Bay, Alaska fjord system, 679
MCLACHLAN, A., DYE, A. and HARTY, B., Simulation of the interstitial system of exposed sandy beaches, 267
Mediterranean Sea; americium; plutonium; radionuclides; contaminant removal; Mytilus, 193
Meiobenthos; spatial distribution; heterogeneity; sampling systems; Nematoda; Copepoda; South Carolina, 471
Meiofauna; bacteria; sand; interstitial; nutrients, 267
—; sediments; colonization; Copepoda, 119
Mercury; metal uptake; salt marshes; marsh plants; crabs; mussels; sewage disposal; Massachusetts coast, 155
Metabolism; bacteria; zinc; heavy metals; intertidal environment; Ireland coast; sediments, 13
Metals; pollution/chemical; estuarine circulation; salinity; Hudson River, 629
Metal uptake; salt marshes; marsh plants; crabs; mussels; sewage disposal; Massachusetts coast; mercury, 155
Micro-algae; species composition; spatial distribution; cultures; Washington coast, neuston; plankton, 3
Microbial degradation; littoral zones; oil pollution; sediments; hydrocarbons; intertidal environment; English Channel; oil spills, 589
MILLER, P. J., *see* FOUDA, M. M., 121
Mineral deposits; Bristol Channel; heavy minerals; entrainment; sediment–water interface; Reynold's Number, 609
Mississippi; debris line; storm surge; carbon; transport; hurricanes, 621
Mixing; entrainment; shear stress; drag coefficients; Froude number; fjords, 461
—; mixing processes; continuity of salt; convective mixing; diffusion–advection models; dispersion, 525
—; Saint Lawrence estuary; numerical model; estuaries; tides; vertical circulation, 375
—; seasonal cycles; estuaries; fjords; glaciers; bottom waters; internal waves; tides, 679
— processes; continuity of salt; convective mixing; diffusion–advection models; dispersion; mixing, 525
— —; vertical; fjords; radon; salinity variations; tidal power; British Columbia coast, 131
MOORE, W. S., Radium isotopes in the Chesapeake Bay, 713
MORRIS, A. W., BALE, A. J. and HOWLAND, R. J. M., Nutrient distributions in an estuary: evidence of chemical precipitation of dissolved silicate and phosphate, 205
Mussels; detritus; salt marshes; Tijuana Estuary, California, 739

—; sewage disposal; Massachusetts coast; mercury, metal uptake; salt marshes; marsh plants; crabs, 155
Mytilus; Mediterranean Sea; americium; plutonium; radionuclides; contaminant removal, 193
NELSON, W. G., *see* KULCZYCKI, G. R., 341
Nematoda; Copepoda; South Carolina; meiobenthos; spatial distribution; heterogeneity; sampling systems, 471
Neuston; plankton; micro-algae; species composition; spatial distribution; cultures; Washington coast, 3
New Zealand coast; limnology (physical); estuarine sedimentation; circulation; suspended sediments; salt wedge; salinity data; temperature profiles, 23
Nitrates; phosphates; silicates; estuaries; chemical interactions; England coast; nutrients, 205
—; silicates; zooplankton; Gastropoda; wind; phytoplankton; nutrients; ammonia, 701
Nitrogen; caloric content; Polychaeta; nutrition; detritus, 39
— fixation; estuaries; algae; mats; Gulf of Mexico; Texas coast, 231
Nova Scotia coast; salt marshes; vegetation; growth rates; age determination; annual cycles; seasonal variations; carbohydrates, 579
— — —; sediments; carbon dioxide; oxygen; organic matter, 725
Numerical model; current measurements; Irish Sea; surges, 655
— —; estuaries; tides; vertical circulation; mixing; Saint Lawrence estuary, 375
— —; resistance; tidal rivers; Wales coast; shear stress, 303
Nutrients; ammonia; nitrates; silicates; zooplankton; Gastropoda; wind; phytoplankton, 701
—; meiofauna; bacteria; sand; interstitial, 267
—; nitrates; phosphates; silicates; estuaries; chemical interactions; England coast, 205
Nutrition; detritus; nitrogen; caloric content; Polychaeta, 39
OFFICER, C. B. and LYNCH, D. R., Dynamics of mixing in estuaries, 525
—, *see* RATTRAY, M., Jr., 251
Oil pollution; sediments; hydrocarbons; intertidal environment; English Channel; oil spills; microbial degradation; littoral zones, 589
— spills; microbial degradation; littoral zones; oil pollution; sediments; hydrocarbons; intertidal environment; English Channel, 589
Oligochaeta; British Columbia coast; salinity variations; interstitial water; benthic organisms; seasonal cycles; estuaries, 49
Oregon coast; salt marshes; primary productivity, 451
— —; Washington coast; Columbia River; diatoms; beach width; slopes; clay mineralogy; grain size, 217
Organic compounds; phosphorus; excretion; tropical regions; brackish waters; Ivory Coast, 511
— matter; Nova Scotia coast; sediments; carbon dioxide; oxygen, 725
Oxygen; organic matter; Nova Scotia coast; sediments; carbon dioxide, 725
PAGÈS, J., *see* LEMASSON, L., 511
PARKER, J. G., Ciliated protozoa of the polluted Tees estuary, 337
PATRIQUIN, D. G., *see* LIVINGSTONE, D. C., 579
Pelagic; catch; gill nets; Jamaica; fish; coasts, 167
PENROSE, J. D. and BEER, T., Acoustic reflection from estuarine pycnoclines, 237
Phase; amplitude; Bristol Channel; bays; tidal friction; energy balance; friction coefficients, 279
PHILLIPS, G. A., *see* HARGRAVE, B. T., 725
Phosphates; silicates; estuaries; chemical interactions; England coast; nutrients; nitrates, 205
Phosphorus; excretion; tropical regions; brackish waters; Ivory Coast; organic compounds, 511
Photosynthesis; marsh plants; Georgia coast; gas exchange, 561
Phytoplankton; ecology; population dynamics; primary production; estuarine circulation; San Francisco Bay, 83
—; nutrients; ammonia; nitrates; silicates; zooplankton; Gastropoda; wind, 701
PICKAVER, A. H. and LYES, M. C., Aerobic microbial activity in surface sediments containing high or low concentrations of zinc taken from Dublin Bay, Ireland, 13
PICKRILL, R. A., IRWIN, J. and SHAKESPEARE, B. S., Circulation and sedimentation in a tidal-influenced fjord lake: Lake McKerrow, New Zealand, 23
Plankton; micro-algae; species composition; spatial distribution; cultures; Washington coast; neuston, 3
Plutonium; radionuclides; contaminant removal; Mytilus; Mediterranean Sea; americium, 193

Pollution/chemical; estuarine circulation; salinity; Hudson River; metals, 629
Polychaeta; nutrition; detritus; nitrogen; caloric content, 39
Population dynamics; biomass; sea grasses; algae; coastal lagoons; Florida coast; community composition; decapod crustaceans, 485
— —; growth rates; reproduction; littoral; South Africa coast; bivalves, 101
— —; primary production; estuarine circulation; San Francisco Bay; phytoplankton; ecology, 83
— —; sea grasses; Florida; algae; fish; ecology; predator control; gobies, 341
Ports; Great Britain; tides; sea levels; flood; frequencies; distribution; annual variations, 389
Predator control; gobies; population dynamics; sea grasses; Florida; algae; fish, ecology, 341
Primary production; estuarine circulation; San Francisco Bay, phytoplankton; ecology; population dynamics, 83
— productivity; Oregon coast; salt marshes, 451
Productivity; life cycles; Amphipoda; Isle of Man, 665
Pycnocline; zooplankton; salt wedge; acoustic scattering; reflection, 237
Radioactive dating; sea levels; Caribbean Sea; terraces; erosion; coastal erosion forms; limestone, 569
— isotopes; radium; Chesapeake Bay, 713
Radionuclides; contaminant removal; Mytilus; Mediterranean Sea; americium; plutonium, 193
Radium; radioactive isotopes; Chesapeake Bay, 713
Radon; salinity variations; tidal power; British Columbia coast; mixing processes; vertical; fjords, 131
RATTRAY, M., Jr. and OFFICER, C. B., Discussion of trace metals in the waters of a partially-mixed estuary, 251
Reflection; pycnocline; zooplankton; salt wedge; acoustic scattering, 237
Reproduction; English Channel; fish; gobies; estuaries; scales; age determination, growth, 121
—; littoral; South Africa coast; bivalves; population dynamics; growth rates, 101
Resistance; tidal rivers; Wales coast; shear stress; numerical model, 303
Resonance; Celtic Sea; Bristol Channel; semidiurnal tide, 291
Reynold's Number; mineral deposits; Bristol Channel; heavy minerals; entrainment; sediment–water interface, 609
Rivers; chelates; dialysis; coagulation; Australia coast; speciation; heavy metals; estuaries, 353
Saint Lawrence estuary; numerical model; estuaries; tides; vertical circulation; mixing, 375
— data; temperature profiles; New Zealand coast; limnology (physical); estuarine sedimentation; circulation; suspended sediments; salt wedge, 23
Salinity; Hudson River; metals; pollution/chemical; estuarine circulation, 629
— variations; interstitial water; benthic organisms; seasonal cycles; estuaries; Oligochaeta; British Columbia coast, 49
— —; — —; British Columbia coast; sediment cores, 67
— —; tidal power; British Columbia coast; mixing processes; vertical; fjords; radon, 131
SALOMON, J. C., *see* DE BORNE DE GRANDPRÉ, C., 375
Salt marshes; marsh plants; crabs; mussels; sewage disposal; Massachusetts coast; mercury; metal uptake, 155
— —; primary productivity; Oregon coast, 451
— —; Tijuana Estuary, California; mussels; detritus, 739
— —; vegetation; growth rates; age determination; annual cycles; seasonal variations; carbohydrates; Nova Scotia coast, 579
— wedge; acoustic scattering; reflection; pycnocline; zooplankton, 237
— —; salinity data; temperature profiles; New Zealand coast; limnology (physical); estuarine sedimentation; circulation; suspended sediments, 23
Sampling systems; Nematoda; Copepoda; South Carolina; meiobenthos; spatial distribution; heterogeneity, 471
Sand; interstitial; nutrients; meiofauna; bacteria, 267
San Francisco Bay; phytoplankton; ecology; population dynamics; primary production; estuarine circulation, 83
Scales; age determination; growth; reproduction; English Channel; fish; gobies; estuaries, 121
SCOTTO, L. E., *see* GORE, R. H., 485
Sea grasses; algae; coastal lagoons; Florida coast; community composition; decapod crustaceans; population dynamics; biomass, 485
— —; Florida; algae; fish; ecology; predator control; gobies; population dynamics, 341

— levels; Caribbean Sea; terraces; erosion; coastal erosion forms; limestone; radioactive dating, 569
— —; flood; frequencies; distribution; annual variations; ports; Great Britain; tides, 389
Seasonal cycles; estuaries; fjords; glaciers; bottom waters; internal waves; tides; mixing, 679
— —; —; Oligochaeta; British Columbia coast; salinity variations; interstitial water; benthic organisms, 49
— variations; carbohydrates; Nova Scotia coast; salt marshes; vegetation; growth rates; age determination; annual cycles, 579
Sediment cores; salinity variations; interstitial water; British Columbia coast, 67
Sediment–water interface; Reynold's Number; mineral deposits; Bristol Channel; heavy minerals; entrainment, 609
Sediments; carbon dioxide; oxygen; organic matter; Nova Scotia coast, 725
—; colonization; Copepoda; meiofauna, 119
—; hydrocarbons; intertidal environment; English Channel; oil spills; microbial degradation; littoral zones; oil pollution, 589
—; metabolism; bacteria; zinc; heavy metals; intertidal environment; Ireland coast, 13
Semidiurnal tide; resonance; Celtic Sea; Bristol Channel, 291
Sewage disposal; Massachusetts coast; mercury; metal uptake; salt marshes; marsh plants; crabs; mussels, 155
SHACKLEY, S. E., The intertidal soft sediments and their macrofauna in the Greater Swansea Bay area (Worm's Head to Nash Point), South Wales, 535
SHAKESPEARE, B. S., *see* PICKRILL, R. A., 23
Shear stress; drag coefficients; Froude number; fjords; mixing; entrainment, 461
— —; numerical model; resistance; tidal rivers; Wales coast, 303
SHEPPARD, C. R. C., The groove and spur structures of Chagos atolls and their coral zonation, 549
Silicates; estuaries; chemical interactions; England coast; nutrients; nitrates; phosphates, 205
—; zooplankton; Gastropoda; winds; phytoplankton; nutrients; ammonia; nitrates, 701
Slopes; clay mineralogy; grain size; Oregon coast; Washington coast; Columbia River; diatoms; beach width, 217
SMETHIE, W. M., Jr., Vertical mixing rates in fjords determined using radon and salinity as tracers, 131
South Africa coast; bivalves; population dynamics; growth rates; reproduction; littoral, 101
— Carolina; meiobenthos; spatial distribution; heterogeneity; sampling systems; Nematoda; Copepoda, 471
Spatial distribution; cultures; Washington coast; neuston; plankton; micro-algae; species composition, 3
— —; heterogeneity; sampling systems; Nematoda; Copepoda; South Carolina; meiobenthos, 471
Speciation; heavy metals; estuaries; rivers; chelates; dialysis; coagulation; Australia coast, 353
Species composition; spatial distribution; cultures; Washington coast; neuston; plankton; micro-algae, 3
Spurs; calcareous sediments; algae; coral atolls; zonation, 549
STENTON-DOZEY, J., *see* GRIFFITHS, C. L., 645
Storm surge; carbon; transport; hurricanes; Mississippi; debris line, 621
Strand and strandline; faunal association; dehydration; degradation; Insecta; Amphipoda; kelp, 645
Surges; numerical model; current measurements; Irish Sea, 655
Suspended sediments; salt wedge; salinity data; temperature profiles; New Zealand coast; limnology (physical); estuarine sedimentation; circulation, 23
TABITA, F. R., *see* GOTTO, J. W., 231
TEAL, J. M., *see* BRETELER, R. J., 155
Temperature profiles; New Zealand coast; limnology (physical); estuarine sedimentation; circulation; suspended sediments; salt wedge; salinity data, 23
TENORE, K. R., Organic nitrogen and caloric content of detritus. I. Utilization by the deposit-feeding polychaete, *Capitella capitata*, 39
Terraces; erosion; coastal erosion forms; limestone; radioactive dating; sea levels; Caribbean Sea, 569
Texas coast; nitrogen fixation; estuaries; algae; mats; Gulf of Mexico, 231
Tidal currents; tide models; Long Island; estuarine circulation, 177

— friction; energy balance; friction coefficients; phase; amplitude; Bristol Channel; bays, 279
— power; British Columbia coast; mixing processes; vertical; fjords; radon; salinity variations, 131
— rivers; Wales coast; shear stress; numerical model; resistance, 303
Tide models; Long Island; estuarine circulation; tidal currents, 177
Tides; mixing; seasonal cycles; estuaries; fjords; glaciers; bottom waters; internal waves, 679
—; sea levels; flood; frequencies; distribution; annual variations; ports; Great Britain, 389
—; vertical circulation; mixing; Saint Lawrence estuary; numerical model; estuaries, 375
Tijuana Estuary, California; mussels; detritus; salt marshes, 739
Tolerance; Ciliata; England coast; heavy metals, 337
TONER, R. C., Interrelationships between biological, chemical and physical variables in Mount Hope Bay, Massachusetts, 701
Tracers; dyes; vertical; horizontal; Wales coast; estuarine circulation; diffusion, 323
Transport; hurricanes; Mississippi; debris line; storm surge; carbon, 621
Tropical regions; brackish waters; Ivory Coast; organic compounds; phosphorus; excretion, 511
VALETT, M., *see* HARDY, J. T., 3
VALIELA, I., *see* BRETELER, R. J., 155
VAN BAALEN, C., *see* GOTTO, J. W., 231
Vegetation; growth rates; age determination; annual cycles; seasonal variations; carbohydrates; Nova Scotia coast; salt marshes, 579
— circulation; mixing; Saint Lawrence estuary; numerical model; estuaries, tides, 375
Vertical; fjords; radon; salinity variations; tidal power; British Columbia coast; mixing processes, 131
—; horizontal; Wales coast; estuarine circulation; diffusion; tracers; dyes, 323
VIRNSTEIN, R. W., *see* KULCZYCKI, G. R., 341
Wales coast; estuarine circulation; diffusion; tracers; dyes; vertical; horizontal, 323
— —; macrobenthos; zonation; intertidal sand habitat; grain size composition; wave energy; wave environment, 535
— —; shear stress; numerical model; resistance; tidal rivers, 303
Washington coast; Columbia River; diatoms; beach width; slopes; clay mineralogy; grain size; Oregon coast, 217
— —; neuston; plankton; micro-algae; species composition; spatial distribution; cultures, 3
Wave energy; wave environment; Wales coast; macrobenthos; zonation; intertidal sand habitat; grain size composition, 535
— environment; Wales coast; macrobenthos; zonation; intertidal sand habitat; grain size composition; wave energy, 535
WEST, J. R. and COTTON, A. P., The measurement of diffusion coefficients in the Conwy estuary, 323
WILLIAMS, P., Detritus utilization by *Mytilus edulis*, 739
WILSON, K. A., *see* GORE, R. H., 485
Wind; phytoplankton; nutrients; ammonia; nitrates; silicates; zooplankton; Gastropoda, 701
Zinc; heavy metals; intertidal environment; Ireland coast; sediments; metabolism; bacteria, 13
Zonation; intertidal sand habitat; grain size composition; wave energy; wave environment; Wales coast; macrobenthos, 535
—; spurs; calcareous sediments; algae; coral atolls, 549
Zooplankton; Gastropoda; wind; phytoplankton; nutrients; ammonia; nitrates; silicates, 701
—; salt wedge; acoustic scattering; reflection; pycnocline, 237